

**2016 LOWER COLUMBIA RIVER FALL SEINE FISHERY
MONITORING REPORT**

Ann E. Stephenson
Washington Department of Fish and Wildlife

Oregon Department of Fish and Wildlife

Joint Columbia River Management Staff

January 2017

Acknowledgements

The author would like to thank a number of people from the Washington Department of Fish and Wildlife (WDFW) and Oregon Department of Fish and Wildlife (ODFW) for their assistance with this project. For their review of the report: Thomas Wadsworth (WDFW), Cindy LeFleur (WDFW), Ron Roler (WDFW), Jeff Whisler (ODFW), Matthew Gardner (ODFW) and Howard Takata (ODFW); for in-season coordination, Adam Storch (ODFW); for database development, Michelle Groesbeck (WDFW); to the field staff who spent long days conducting the on-board fisheries observations: Trever Barker, Christine Brandtner, Ellory Loughridge, Eric Mooney, Amber Santangelo, and Joe Sheffield (WDFW); Matt Collver and Nick Pitz (ODFW); and for the cooperation of the commercial fishermen who participated in this fishery.

Summary

The 2016 commercial seine fishery was one component of the overall non-Indian commercial fisheries in the lower Columbia River downstream of Bonneville Dam. The fishery was scheduled for twenty periods (or days) between August 22nd and September 30th. The fishery was actively fished from September 6th through September 30th. A total of four seine permits were issued, two for purse seines and two for beach seines. The beach seiners were allowed to fish in non-Indian commercial fishing Zones 2 and 3, while the purse seiners could fish in Zones 1 and 3 (Figure 1). The restrictions on the fishing location were an effort to help the Washington Department of Fish and Wildlife (WDFW) and Oregon Department of Fish and Wildlife (ODFW) collect data on the fish stock composition for salmonids from areas where limited data had been collected in the previous two years of seine fishing, in an effort to more fully model mainstem commercial fisheries throughout the lower Columbia River.

Overall, 4,103 steelhead, fall Chinook and Coho salmon were caught, either kept or released, in the 2016 seine fishery. 4,055 salmonids were caught in purse seines and 48 in beach seines. The majority of those fish were fall Chinook salmon (70%), followed by Coho salmon (23%) and steelhead (7%). The majority of the fish caught and kept by both gear types were adult fish. Ninety percent of the fall Chinook salmon were adults and 83% of the Coho salmon were adults. The immediate mortality rate for this fishery was less than 0.3% of the total number of fall Chinook salmon, Coho salmon and steelhead caught.

The individual fishing quota (IFQ) for each purse seine was 750 kept adult fall Chinook salmon, 600 kept adult Coho salmon, or 230 handled steelhead, whichever species-specific quota was met first. The two purse seiners kept a total of 1,113 fall Chinook salmon, including 728 adipose fin-clipped (marked) adults, 93 marked jacks, 272 unmarked adults, and 20 unmarked jacks. Of the 1,500 adult fall Chinook available for harvest, a total of 1,000 adults, both marked and unmarked, were harvested by the two purse seiners, representing 67% of their combined IFQs. A total of 469 adult Coho salmon were retained, all marked, which represented 39% of the Coho salmon IFQ for purse seines. A total of 295 steelhead were handled in the purse seines (16 unmarked A-run, 104 marked A-run, 31 unmarked B-run and 144 marked B-run), which was 64% of the allowable steelhead handle for the purse seines combined. The overall mark rates for adult fall Chinook salmon caught in the purse seines was 30% and the mark rate for adult Coho salmon was 63%. The overall mark rate for steelhead handled by the purse seines was 84%.

The IFQ for each beach seine was 600 kept adult fall Chinook salmon, 400 kept Coho salmon, or 320 handled steelhead, whichever quota was met first. The beach seiners fished a total of six days and caught very few fish overall. Some of their time entailed exploring new areas and experiencing equipment difficulties. Overall, two fall Chinook salmon (one marked jack and one unmarked adult) and 39 marked Coho salmon (13 adult and 26 jacks) were harvested by the beach seiners. Five unmarked Coho salmon and 2 steelhead (one unmarked A-run and one marked B-run) were released.

One of the objectives of the fishery was to determine the steelhead to adult fall Chinook salmon ratios by gear type and fishing zone. The following ratios are for adult fish from the purse seines: steelhead to marked fall Chinook salmon 2:5; steelhead to unmarked fall Chinook 1:6;

and steelhead to all fall Chinook 1:8. The beach seine catch was not substantial enough to allow for meaningful comparisons, with only one adult fall Chinook caught and two steelhead released.

Some of all three of the objectives for this fishery were addressed in 2016, including the collection of steelhead to fall Chinook salmon ratios by gear type and fishing zone, the collection of CWT data from the landed catch to determine fall Chinook salmon stock composition, and the collection of immediate mortality rates for these two gear types. Challenges in 2016 included the lack of purse seine fishing in Zone 1, where catch data are still needed, and the low effort and catch from the beach seines.

Background

In 2016, a non-Indian emerging commercial seine fishery, using both purse and beach seines, was implemented by the states of Oregon and Washington for a third consecutive year in the Columbia River below Bonneville Dam. In 2014, the fishery operated under research impacts, while in 2015 and 2016 the allowable impacts were 10% of the non-Indian commercial fishery allocation. This fishery was part of the management framework adopted by the Washington and Oregon Fish and Wildlife Commissions (Commissions) in 2013, which established policies and rules relating to the development and implementation of alternative forms of commercial fishing gear. The Washington Commission's policy objectives required the Washington Department of Fish and Wildlife (WDFW) to "...develop and implement selective-fishing gear and techniques for commercial mainstem fisheries to optimize conservation and economic benefits (Washington Fish and Wildlife Commission Policy C-3620)."

The background information below is from the 2015 seine fishery report (Stephenson 2016):

Since 2009, Oregon Department of Fish and Wildlife (ODFW) and WDFW fisheries staff have been evaluating alternative gear types for use in lower Columbia River commercial fisheries. The use of two particular gear types, beach and purse seines, were outlawed in the State of Washington in 1935 and in the State of Oregon in 1950. In recent years, legislation and regulations by both states have allowed for the use of these gear types for research and commercial purposes. The intent of using these two gear types is to allow for a mark-selective fishery where fish are captured alive. The live capture of fish allows for hatchery stocks of salmon, marked with an adipose fin-clip or left ventral fin-clip, to be retained for harvest while allowing for the live release of unmarked (unclipped) salmon and all steelhead.

The mainstem commercial seine fishery, as with all other non-Indian commercial fisheries on the Columbia River, was established by the Columbia River Compact (Compact). The Compact consists of the directors of ODFW and WDFW or their delegates acting on behalf of the commissions of both agencies.

In 2014, the allowable Endangered Species Act (ESA) impacts on listed stocks of salmon and steelhead for this fishery were taken from impacts set aside for research fisheries. 2015 was the first year the seine fishery utilized ESA impacts set aside for non-Indian commercial fisheries. Under guidance from both Commissions, the allowable ESA

impacts on tule fall Chinook salmon for non-Indian fisheries are shared between commercial and recreational fisheries. Sharing guidelines currently allocate no more than 70% of the available impacts for tule fall Chinook salmon to the mainstem recreational fisheries and the balance, no less than 30%, to: “off-channel commercial fisheries; mainstem commercial fisheries that target upriver bright fall Chinook salmon; and, if selective gear is developed during the transition period, mainstem commercial fisheries that harvest Washington Lower river Hatchery fall Chinook salmon to help reduce strays (Washington Fish and Wildlife Commission Policy Decision C-3620).” Because impacts available to the commercial fisheries are limited, the 2015 seine fishery was restricted in scope to provide a reasonable economic return for participants while minimizing the effects on mainstem gillnet opportunities. Pre-season modelling for the seine fishery was based on using 10% or less of the non-Indian commercial impacts for lower Columbia River tule fall Chinook salmon or wild B-run steelhead, whichever was more constraining. This sub-allocation of available commercial impacts for the seine fishery was negotiated with the commercial fishing industry during the North of Falcon process, an annual event where representative from federal, state and tribal governments and the recreational and commercial fishing industries meet.

As in 2014 and 2015, the 2016 seine fishery was set for the latter part of August throughout the month of September. This fishery focused predominately on the return of Columbia River hatchery fall Chinook salmon *Oncorhynchus tshawytscha* as well as hatchery Coho salmon *Oncorhynchus kisutch*. All steelhead *Oncorhynchus mykiss*, White Sturgeon *Acipenser transmontanus* and other by-catch were released.

The objectives for the 2016 commercial seine fishery listed in the Columbia River Joint Staff 2016 Columbia River Commercial Seine Permit Hold Information Packet were to:

1. Collect coded-wire tag (CWT) data from the landed catch to determine fall Chinook salmon stock composition;
2. Determine steelhead to fall Chinook salmon ratios by gear type and fishing zone;
3. Compare the immediate mortalities to those observed during previous research (and seine fisheries).

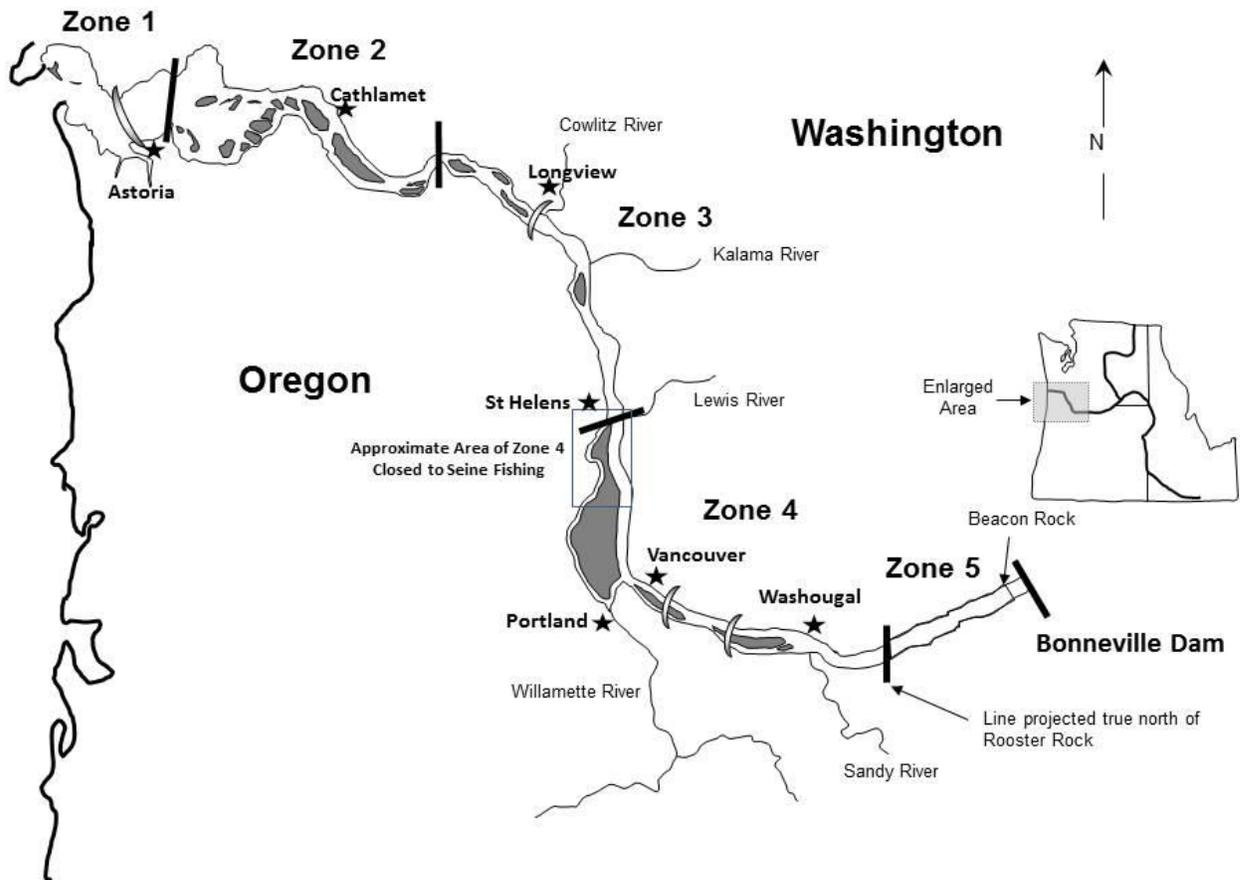


Figure 1. Lower Columbia River non-Indian commercial fishing zones (ODFW). The 2016 seine fishery occurred in Zones 2 and 3.

2016 Seine Fishery Permits

As in the two previous years, the 2016 seine fishery was a limited entry fishery. Washington residents were required to have an emerging fishery license and an experimental fishery permit, while Oregon residents were required to have an experimental gear permit. Two beach and two purse seine permits were available through a lottery system, in contrast to the previous two years when six beach seine permits and four purse seine permits were available. The application process was again limited to those who held a current Columbia River commercial salmon license with commercial landings from either mainstem Columbia River or Select Area fisheries in the previous two calendar years.

In 2014, the commercial seine fishery was open throughout the lower Columbia River in commercial fishing Zones 1 through 4. The majority of fish were caught in Zone 1 off of Sand Island and in the lower (downstream) portion Zone 4 off of Bachelor Island (Figure 1). In 2015, the fishery was only open in Zones 2, 3, and the upper portion of Zone 4, in an attempt to fill in stock composition and catch rate data gaps from the previous year. During 2016, the fishery was

limited to Zones 1 and 3 for purse seines and Zones 2 and 3 for beach seines. These areas were selected because of the continued effort to obtain a comprehensive dataset from throughout the lower Columbia River, including the stock composition of fall Chinook salmon caught with seines. This information can be subsequently utilized to model future fisheries in this area.

An initial letter of interest along with an application was mailed out in late May 2016 to all Columbia River commercial fishing license holders. A total of eleven applications were received for the four available permits. Two beach and two purse seine permits were awarded in July through a random drawing. Both purse seine permits and one of the beach seine permits were issued by Washington and one beach seine permit was issued by Oregon.

On August 2, 2016, the Columbia River Joint Staff which is made up of members of ODFW and WDFW fisheries management staff, distributed the “2016 Columbia River Commercial Seine Permit Holder Information Packet” to the permit recipients. The packet included background information and policy objectives, fishery objectives, agency contact information, specific gear and fishery regulations, season timeframe, information on individual fish quotas, the observer program, data collection, and other topics.

Post-Release Mortality Rates

Post-release mortality rates for each salmonid species by gear type for the 2016 seine fishery were recommended by the *U.S. v Oregon* Technical Advisory Committee (Table 1). The mortality rates used in 2016 were the same rates as those used in 2015, which differed slightly from those used in the 2014 fishery. These mortality rates, along with the pre-season salmonid forecasts, were established prior to the season to help fishery managers determine the number of fish available for harvest and to establish a season structure for this fishery. These rates were applied both in-season and post-season to the fish released from this fishery to track the impacts on ESA-listed salmon and steelhead.

Table 1. 2016 Lower Columbia River seine fishery post-release mortality rates.

Species	Beach Seine	Purse Seine
Fall Chinook Salmon	33%	21%
Coho Salmon	38%	29%
Steelhead	5%	2%

Individual Fishing Quotas

An individual fishing quota (IFQ) was established for each salmonid species for each gear type (Table 2). The IFQs in 2016 increased substantially from 2015 because there were fewer permits issued for each gear type. The IFQs were determined pre-season and were included in the letter of interest that was sent out to potential permittees. The IFQs served multiple purposes, one of which was to help the applicants determine in advance the costs and benefits of participating in the fishery. Other purposes of the IFQs were to distribute the catch fairly among participants and to help ensure that the seine fishery remained within its allowed sub-allocation of the overall

non-Indian commercial fishery in the lower Columbia River. If one of the three IFQs was met, whether it was the number of fall Chinook or Coho salmon kept or the number of steelhead handled and released, the permit was considered ‘full’ and fishing would cease. If fish of the other harvestable salmon species, either fall Chinook or Coho salmon, were still available in the IFQ when the quota for the other species was met, those fish could also be retained in the final fishing set. For example, if the fall Chinook salmon quota was met during the middle of a set, only allowable Coho salmon remaining could be retained in the final set.

Both jack and adult hatchery salmon could be retained in this fishery, although only the adult salmon counted towards the IFQs. Any fall Chinook salmon greater than or equal to 24 inches in total length and any Coho salmon greater than or equal to 20 inches in total length was considered an adult fish.

Table 2. 2016 Lower Columbia River seine fishery individual fishing quotas.

Species	Beach Seine	Purse Seine
Adult Chinook Salmon	600	750
Adult Coho Salmon	400	600
Steelhead handle	320	230

Season Structure

The 2016 seine fishery season was adopted at the August 16, 2016 Compact hearing. Columbia River Joint State Action Notices can be found on the WDFW and ODFW websites:

<http://wdfw.wa.gov/fishing/crc/> or

http://www.dfw.state.or.us/fish/OSCRP/CRM/action_notes.asp.

A total of seventeen fishing periods were initially set starting August 22nd and ending September 28th.

At the August 25th Compact hearing, the allowable sales of fish were modified to include the retention of “...any fall Chinook caught with a purse seine on September 7th and any fall Chinook caught with a beach seine on September 14th.” As a result of this modification the seine fishers could harvest fall Chinook salmon with intact adipose fins (unmarked) for one day, rather than being limited to harvesting hatchery (marked) fish only. The purpose of this effort was to ascertain if the fishers could selectively harvest the more abundant unmarked bright fall Chinook salmon, while releasing unmarked tule fall Chinook salmon. A limiting factor for fisheries in the lower Columbia River in the fall is the impact on natural-origin tule fall Chinook salmon. To minimize impacts, any allowed harvest of unmarked Chinook for the seine fishery in the future would be contingent on the fishers ability to accurately distinguish tule fall Chinook salmon from bright fall Chinook salmon.

In addition to on-board observations, all fish landed in the seine fishery were also commercially sampled by WDFW or ODFW. In addition to the CWT and biological data collected during sampling, genetic samples were also collected from all fall Chinook salmon harvested, both

marked and unmarked. Genetic samples will be analyzed by WDFW to help determine whether the unmarked fish were tule or bright fall Chinook salmon.

Three additional periods were added to the last week of the season at the September 22nd Compact hearing. Overall, the fishery was open for a total of 20 fishing periods. The total open hours for each period were reduced from the previous two years to help facilitate the sampling of the fishery. Fishing was open for ten hours per day from 6:00 a.m. to 4:00 p.m. through September 11th and from 7:00 a.m. to 5:00 p.m. through September 30th. Seine fishing, unlike other commercial fisheries in the lower Columbia River in the fall, occurred only during daylight hours.

Gear and Fishery Requirements

The specifics of the fishing gear were outlined in the August 16th and two subsequent Compact Action Notices. The regulations included the details of the fishery: who could participate in the fishery, the season structure, sanctuaries, gear types, allowable sales, salmonid handling and sorting criteria including sort times (limited to 75 minutes), the mandatory observer program and catch reporting requirements. The specifications in each of these areas can be found in more detail in the Compact Action Notices.

Data Collection

Each permit holder was required to have at least one ODFW or WDFW observer present at all times during fishing operations. Information was collected for each fishing set including catch and release data. A fishing set was defined as the time from when the seine was first laid out until the last fish in the set was handled, either kept or released to the river. Data were recorded on datasheets, transferred into an Apple iPad mini 3, and uploaded to a database each day of the fishery. Data collected for each set included: the permit identification number, date, set number, fishing zone, gear type, drift location name, GPS coordinates, water temperature, layout start time (when the first cork on the seine goes in the water), sort start time (varied by gear type), sort stop time (when the last fish was removed from the seine), net length, net depth, and mesh size. The kept catch was separated by life stage (adults or jacks) and species (fall Chinook or Coho salmon). Data collected from released salmon and steelhead included whether they were alive or dead and whether or not they were marked. Additional data collected for steelhead included stock information which was determined by length. Steelhead measuring 78 cm fork length (FL) and greater were considered B-run, while steelhead less than 78 cm FL were considered A-run. White Sturgeon and all other fish species caught were also tallied and released.

Results from the Fishery

Although the fishery officially opened August 22nd, the first day of fishing by a purse seiner took place on September 6th. Of the 20 days available to seine fish, fishing occurred on 14 different days. The two beach seiners fished three days each for a total of six days over a two-week period between September 12th and 26th (Table 5.) They fished four days in Zones 2 and two days in Zone 3. The two purse seiners fished exclusively in Zone 3 for a total of 21 days, often

fishing on the same day. One purse seiner fished a total of ten days and the other fished a total of eleven days, both between September 6th and September 30th (Table 4).

Net Length and Mesh Size

Under the gear regulations adopted by the Compact, the net length for both beach and purse seines was not to exceed 200 fathoms. In 2016, the beach seines ranged in length from 125 to 175 fathoms and the purse seines ranged in length from 180 to 200 fathoms. Net depth could not exceed 200 meshes, which is approximately 50 feet. The beach seines had a depth of 30 and 40 feet, while the purse seines had a depth of 35 and 50 feet. The mesh size was restricted to 3.5 inches maximum for both gear types. Three of the seiners used a mesh size of 3.5 inches while one beach seiner used a net with a mesh size of 2.0 inches.

Sets per day

On average, the purse seiners fished more sets per day than the beach seiners. One purse seiner averaged five sets per day while the other averaged six sets per day. Both beach seiners averaged three sets per day. Both beach seiners were new to seine fishing in the lower Columbia River and challenges with equipment and snagging may have been a limiting factor in the number of sets they could complete in a day and the number of fish caught.

Sort Times

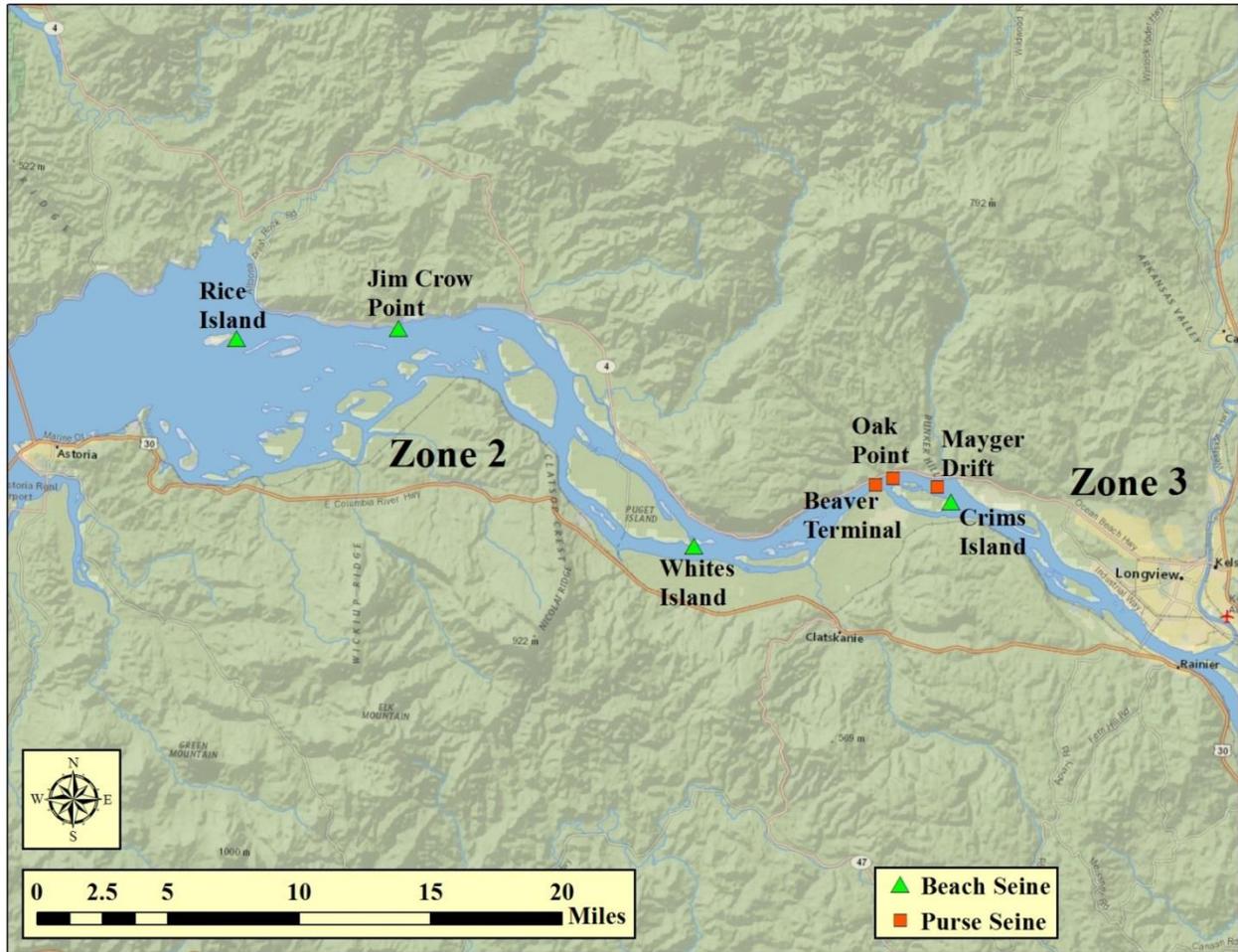
The total sort time for both gear types, per regulation, could not exceed 75 minutes. The sort time for beach seines was defined as the elapsed time from when the outer towed end of the net first contacted the shore or block until the net was emptied of fish. For the purse seines, the sort time was defined as the elapsed time from when all the rings were pursed and out of the water until the net was emptied of fish. Out of a total 136 sets for both gear types (18 beach, 118 purse), the sort time exceeded 50 minutes only three times during the season. Only one beach seine set approached the time limit at 71 minutes. On average, the sort times were slightly higher for the beach seines than purse seines (Table 3). Overall, the sort times were considerably lower than the allowable time limit.

Table 3. 2016 Average sort time for a seine set by gear type and fisher permit number.

Gear Type	Permit #	Avg. Sort Time (minutes)
Beach Seine	2016001	22
	2016002	36
Purse Seine	2016003	21
	2016004	15

Fishing Locations

The purse seiners fished exclusively in Zone 3, with the 86% of their sets occurring in the Mayger Drift, just downstream of Longview, WA (Figure 2). Fifteen sets were made further downstream near the Zone 2/3 line at Beaver Terminal and one set at Oak Point. Seventy-two percent of the beach seine sets occurred in Zone 2. One beach seiner fished five sets on Crims Island in Zone 3 and two sets on Whites Island (east end, off Puget Island) in Zone 2. The other beach seiner fished seven sets on Rice Island and three at Jim Crow Point, both in Zone 2 downstream of Cathlamet, WA.



VanderPloeg WDFW

Figure 2. 2016 Non-Indian commercial beach and purse seine fishing locations in the lower Columbia River.

Water Temperatures

Observers collected water temperature data for each set by using a PINPOINT® calibrated thermometer. During the purse seining observations, the probe was lowered to a depth of five feet for approximately one minute. At the beach seine sites, an observer waded into the water to

about waist deep and lowered the probe to the bottom for approximately one minute. The average water temperature for both gear types during the seine fishery was 68°F. Water temperatures ranged from 66°F to 70°F during the beach seining and from 57°F to 73°F during the purse seining.

Catch and Release Data

Each seining operation was monitored daily. Data collected included set information on the number of salmon kept and released, plus the number of steelhead, sturgeon, and any other by-catch released. In 2016, ODFW monitored one of the beach seine operations and WDFW monitored the two purse seine and one beach seine operation.

Nearly all of the marked fall Chinook and Coho salmon were retained for harvest from the seine fishery, with the exception of two jack Coho salmon released alive and one adult Coho salmon released dead (Table 4). On September 7th for purse seines and September 14th for beach seines, most unmarked fall Chinook salmon were retained for harvest; nine fall Chinook salmon were released by one purse seine fisher after determining that the fish were tule fall Chinook salmon via visual observation. All steelhead, regardless of stock or mark status, were tallied and released.

Data are provided below for fish kept or released by the purse seiners (Tables 4 and 5) and the beach seiners (Tables 6 and 7). Table 8 shows the mark rates for adult fall Chinook and Coho salmon and Table 9 shows the mark rates for steelhead caught in purse seines. Mark rates were not determined for the beach seines because of the extremely low catch rates.

Table 4. 2016 Fall Chinook and Coho salmon retained in purse seines in Zone 3.

Week	Date	Permittee	# Sets	Chinook					Coho		
				Marked Adults	Marked Jacks	Unmarked Adults	Unmarked Jacks	Total	Marked Adults	Marked Jacks	Total
37	9/6/2016	2016003	2	22	5	0	0	27	10	1	11
37	9/7/2016	2016003	7	74	10	113	15	212	31	2	33
37	9/7/2016	2016004	9	82	3	159	5	249	22	0	22
37	9/8/2016	2016003	6	97	12	0	0	109	59	16	75
37	9/8/2016	2016004	5	57	6	0	0	63	47	2	49
37	9/9/2016	2016003	5	68	3	0	0	71	51	11	62
37	9/9/2016	2016004	3	24	0	0	0	24	2	0	2
38	9/12/2016	2016003	6	28	6	0	0	34	21	4	25
38	9/12/2016	2016004	8	50	9	0	0	59	22	2	24
38	9/13/2016	2016003	5	44	6	0	0	50	15	3	18
38	9/13/2016	2016004	8	85	10	0	0	95	21	2	23
38	9/14/2016	2016004	7	22	3	0	0	25	10	0	10
38	9/15/2016	2016003	5	14	1	0	0	15	14	1	15
38	9/15/2016	2016004	6	26	3	0	0	29	5	2	7
39	9/21/2016	2016003	6	12	7	0	0	19	15	9	24
39	9/21/2016	2016004	4	4	0	0	0	4	7	1	8
40	9/26/2016	2016003	5	4	3	0	0	7	27	14	41
40	9/28/2016	2016004	5	4	3	0	0	7	13	6	19
40	9/29/2016	2016003	6	5	2	0	0	7	53	15	68
40	9/29/2016	2016004	6	6	1	0	0	7	16	3	19
40	9/30/2016	2016004	4	0	0	0	0	0	8	2	10
Total			118	728	93	272	20	1,113	469	96	565

Table 5. 2016 Salmonids released from purse seines in Zone 3.

Week	Date	Permittee	# Sets	Chinook			Coho			Steelhead				
				Unmarked	Marked	Total	Unmarked	Marked	Total	Unmarked A	Marked A	Unmarked B	Marked B	Total
37	9/6/16	2016003	2	64	0	64	6	0	6	0	0	1	0	1
37	9/7/16	2016003	7	0	0	0	25	0	25	0	2	0	2	4
37	9/7/16	2016004	9	9	0	9	32	0	32	0	2	2	4	8
37	9/8/16	2016003	6	261	0	261	37	0	37	2	13	2	4	21
37	9/8/16	2016004	5	149	0	149	38	0	38	0	5	2	17	24
37	9/9/16	2016003	5	152	0	152	35	0	35	2	10	4	8	24
37	9/9/16	2016004	3	43	0	43	6	0	6	0	1	3	2	6
38	9/12/16	2016003	6	99	0	99	18	0	18	3	9	5	19	36
38	9/12/16	2016004	8	148	0	148	24	0	24	1	5	1	13	20
38	9/13/16	2016003	5	133	0	133	13	0	13	1	21	0	29	51
38	9/13/16	2016004	8	266	0	266	17	0	17	0	2	2	8	12
38	9/14/16	2016004	7	103	0	103	9	1	10	0	1	0	13	14
38	9/15/16	2016003	5	20	0	20	10	0	10	2	5	0	2	9
38	9/15/16	2016004	6	84	0	84	9	0	9	1	2	1	2	6
39	9/21/16	2016003	6	64	0	64	16	1	17	0	3	2	2	7
39	9/21/16	2016004	4	35	0	35	6	0	6	0	2	0	1	3
40	9/26/16	2016003	5	20	0	20	10	0	10	0	6	0	3	9
40	9/28/16	2016004	5	39	0	39	5	0	5	0	0	4	7	11
40	9/29/16	2016003	6	10	0	10	17	0	17	4	15	0	7	26
40	9/29/16	2016004	6	31	0	31	9	1	10	0	0	1	1	2
40	9/30/16	2016004	4	4	0	4	3	0	3	0	0	1	0	1
Total			118	1,734	0	1,734	345	3	348	16	104	31	144	295

Note: Released fall Chinook and Coho salmon combines adults and jacks, released alive or dead.

Table 6. 2016 Fall Chinook and Coho salmon retained in beach seines in Zones 2 and 3.

Week	Date	Permittee	# Sets	Chinook					Coho			
				Marked Adults	Marked Jacks	Unmarked Adults	Unmarked Jacks	Total	Marked Adults	Marked Jacks	Total	
38	9/12/2016	2016001	3	0	0	0	0	0	0	0	1	1
38	9/13/2016	2016001	2	0	0	0	0	0	0	0	0	0
38	9/14/2016	2016002	3	0	0	1	0	1	1	1	3	4
38	9/15/2016	2016001	3	0	0	0	0	0	0	0	0	0
39	9/19/2016	2016002	4	0	0	0	0	0	8	14	22	
40	9/26/2016	2016002	3	0	1	0	0	1	4	8	12	
Total			18	0	1	1	0	2	13	26	39	

Table 7. 2016 Salmonids released from beach seines in Zones 2 and 3.

Week	Date	Permittee	# Sets	Chinook			Coho			Steelhead				
				Unmarked	Marked	Total	Unmarked	Marked	Total	Unmarked A	Marked A	Unmarked B	Marked B	Total
38	9/12/2016	2016001	3	0	0	0	0	0	0	0	0	0	0	0
38	9/13/2016	2016001	2	0	0	0	0	0	0	0	0	0	0	0
38	9/14/2016	2016002	3	0	0	0	0	0	0	0	0	0	0	0
38	9/15/2016	2016001	3	0	0	0	0	0	0	0	0	0	0	0
39	9/19/2016	2016002	4	0	0	0	5	0	5	0	0	0	0	0
40	9/26/2016	2016002	3	0	0	0	0	0	0	1	0	0	1	2
Total			18	0	0	0	5	0	5	1	0	0	1	2

Note: Released fall Chinook and Coho salmon combines adults and jacks.

Table 8. 2016 Mark rates for adult fall Chinook and Coho salmon caught in purse seines in Zone 3.

Date	Permit #	# of Sets	Adult Chinook			Adult Coho		
			Marked	Unmarked	Mark Rate	Marked	Unmarked	Mark Rate
9/6/2016	2016003	2	22	50	31%	10	5	67%
9/7/2016	2016003	7	74	113	40%	31	24	56%
9/7/2016	2016004	9	82	162	34%	22	25	47%
9/8/2016	2016003	6	97	210	32%	59	25	70%
9/8/2016	2016004	5	57	119	32%	47	29	62%
9/9/2016	2016003	5	68	126	35%	51	31	62%
9/9/2016	2016004	3	24	35	41%	2	6	25%
9/12/2016	2016003	6	28	85	25%	21	16	57%
9/12/2016	2016004	8	50	124	29%	22	19	54%
9/13/2016	2016003	5	44	116	28%	15	11	58%
9/13/2016	2016004	8	85	233	27%	21	13	62%
9/14/2016	2016004	7	22	81	21%	11	7	61%
9/15/2016	2016003	5	14	20	41%	14	9	61%
9/15/2016	2016004	6	26	76	25%	5	9	36%
9/21/2016	2016003	6	12	44	21%	15	14	52%
9/21/2016	2016004	4	4	32	11%	7	6	54%
9/26/2016	2016003	5	4	13	24%	27	9	75%
9/28/2016	2016004	5	4	34	11%	13	3	81%
9/29/2016	2016003	6	5	9	36%	53	12	82%
9/29/2016	2016004	6	6	24	20%	16	5	76%
9/30/2016	2016004	4	0	4	0%	8	3	73%
Total		118	728	1710	30%	470	281	63%

Note: In 2016, unlike the previous year, released fish were separated into adults and jacks. The “unmarked” number for adult fish in the table is the observed number, not a calculated value.

Table 9. 2016 Mark rates for steelhead caught in purse seines in Zone 3.

Date	Permit #	# of Sets	A-Run Steelhead			B-Run Steelhead			A and B Steelhead		
			Marked	Unmarked	Mark Rate	Marked	Unmarked	Mark Rate	Total Marked	Total Unmarked	Overall Mark Rate
9/6/2016	2016003	2	0	0		0	1	0%	0	1	0%
9/7/2016	2016003	7	2	0	100%	2	0	100%	4	0	100%
9/7/2016	2016004	9	2	0	100%	4	2	67%	6	2	75%
9/8/2016	2016003	6	13	2	87%	4	2	67%	17	4	81%
9/8/2016	2016004	5	5	0	100%	17	2	89%	22	2	92%
9/9/2016	2016003	5	10	2	83%	8	4	67%	18	6	75%
9/9/2016	2016004	3	1	0	100%	2	3	40%	3	3	50%
9/12/2016	2016003	6	9	3	75%	19	5	79%	28	8	78%
9/12/2016	2016004	8	5	1	83%	13	1	93%	18	2	90%
9/13/2016	2016003	5	21	1	95%	29	0	100%	50	1	98%
9/13/2016	2016004	8	2	0	100%	8	2	80%	10	2	83%
9/14/2016	2016004	7	1	0	100%	13	0	100%	14	0	100%
9/15/2016	2016003	5	5	2	71%	2	0	100%	7	2	78%
9/15/2016	2016004	6	2	1	67%	2	1	67%	4	2	67%
9/21/2016	2016003	6	3	0	100%	2	2	50%	5	2	71%
9/21/2016	2016004	4	2	0	100%	1	0	100%	3	0	100%
9/26/2016	2016003	5	6	0	100%	3	0	100%	9	0	100%
9/28/2016	2016004	5	0	0		7	4	64%	7	4	64%
9/29/2016	2016003	6	15	4	79%	7	0	100%	22	4	85%
9/29/2016	2016004	6	0	0		1	1	50%	1	1	50%
9/30/2016	2016004	4	0	0		0	1	0%	0	1	0%
Total		118	104	16	87%	144	31	82%	248	47	84%

Note: Blank mark rates are days when no fish were caught.

IFQs

The beach seiners caught a very limited number of fish overall, only 3% of their possible combined Coho salmon IFQ and 1% of their available steelhead handle (Table 10). Of the possible 1,500 adult fall Chinook salmon that the purse seiners could retain in the fishery, they harvested 1,000 (67%) of their combined IFQs. The purse seiners reached 39% of their combined adult Coho salmon IFQs (496/1,200). One purse seiner handled 82% of their available steelhead handle, while the other handled 47% of their steelhead IFQ. The difference in steelhead handled between the two purse seines may be accounted for by the differences in fishing locations, such as how close to shore they fished, even though they were fishing within the same area.

Table 10. 2016 Kept adult salmon and released steelhead as a percentage of IFQ by gear type.

Gear Type	Permit #	# Sets	Chinook Salmon			Coho Salmon			Steelhead		
			Kept Adults	IFQ	% IFQ	Kept Adults	IFQ	% IFQ	Released	IFQ	% IFQ
Beach seine	2016001	8	0	600	0%	0	400	0%	0	320	0%
	2016002	10	1	600	0%	13	400	3%	2	320	1%
Purse seine	2016003	53	481	750	64%	296	600	49%	188	230	82%
	2016004	65	519	750	69%	173	600	29%	107	230	47%

Note: In 2016 kept fall Chinook salmon includes mostly marked and a few unmarked fish.

Immediate mortalities

Immediate mortalities were fish found dead in the gear when it was brought in to the boat or shore. All mortalities were released back into the river. There was a low number immediate mortalities in the purse seines and zero from the beach seines (Table 9). Most of the purse seine mortalities, 64%, were unmarked jack fall Chinook salmon. Due to their smaller size, jacks have a higher tendency of getting either wedged or gilled in the seine net. The overall immediate mortality rate for the seine fishery was 0.3% (11 mortalities of 4,103 total salmonids caught). This was similar, though slightly less than, the immediate mortality rate in 2015 (0.4%).

Table 11. 2016 Immediate mortalities of salmonids released from purse seines.

Salmon Species	Life Stage	Adipose Fin	Total
Chinook salmon	Adult	Unmarked	2
Chinook salmon	Jack	Unmarked	7
Coho salmon	Adult	Marked	1
Coho salmon	Jack	Unmarked	1
Total			11

Non-Salmonid By-Catch

More non-salmonid by-catch were caught in the purse seines than the beach seines in 2016, though it should be noted that the purse seines made considerably more sets (118) than the beach seines (18) (Table 12). A total of twenty White Sturgeon were caught in the purse seines. Although regulations permitted the retention of shad, none were retained during this fishery.

Table 12. 2016 By-catch in the seine fishery by gear type and permittee.

Gear Type	Permit #	White	White	Shad	Sucker	Starry Flounder	Northern Pikeminnow	Cutthroat Trout	Chum Salmon
		Sturgeon (<38")	Sturgeon (≥ 38")						
Beach	2016001	0	0	0	0	0	1	0	0
	2016002	0	0	0	0	3	0	0	0
Purse	2016003	7	3	3	0	1	0	1	1
	2016004	4	6	223	1	0	0	0	0
Total		11	9	226	1	4	1	1	1

References

Washington Fish and Wildlife Commission Policy Decision. Columbia River Basin Salmon Management. Policy Number: C-3620. January 12, 2013.

2016 Columbia River Commercial Seine Permit Holder Informational Packet. Columbia River Joint Staff. August 2, 2016.

Stephenson, A.E. 2016. 2015 Lower Columbia River fall Seine Fishery. Joint Staff Report. Washington Department of Fish and Wildlife and Oregon Department of Fish and Wildlife. May 2016.